

**THE UNIVERSITY OF HONG KONG  
FACULTY OF BUSINESS AND ECONOMICS**

**PhD Course Syllabus**

- Course Code/Title:** [IIMT6015] [Research Methodologies in Operations Management ]
- Course Description:** This course introduces students to main research methods (e.g. quantitative model-based research, deterministic optimization, stochastic modeling and simulation) and topics in operation management, with a focus on dynamic decision-making problems. It trains the students by a systematic study of models and methods related to dynamic programming. The articles in major operations management journals serve as the examples for selection of methodology and justification of research contribution. The students are also required to practice on research design for specific research questions.
- Course Objectives:**
1. To provide an understanding of main research methods and topics in conducting research in operations management, with the focus on dynamic programming models and methods
  2. To familiarize students with research problem formulation and modeling, testing and validation in operations management research, using applications in inventory management and revenue management
- To develop skills in conducting research project and writing articles for submission to main operations management journals;
- Pre-requisite:** An introductory course on probability theory (including basic knowledge of Markov chains). Need to be familiar with coding in MATLAB or similar scientific computing software.
- Assessment:** 40% coursework; 20% participation and discussion; 40% presentation
- Remarks:** All PhD courses are non-credit-bearing and will be assessed on a pass/fail basis.

Course Learning Outcomes (CLOs) On completion of this course, students should be able to:	Aligned PLOs*				
	1	2	3	4	5
1. CLO1 Understand the overall approach of dynamic programming	√				
2. CLO2 Master the basic models and solution techniques for problems of sequential decision making under uncertainty (stochastic control)	√	√			
3. CLO3 Develop dynamic programming to practical and relevant business problems		√	√		
4. CLO4 Demonstrate effective communication and presentation skills				√	√

**\*Programme Learning Outcomes (PLOs) for Research Postgraduate Programme:**

1. Demonstrate critical understanding, at an advanced level, of up-to-date knowledge and research methodology of a particular field
2. Implement effective academic and personal strategies for carrying out research projects independently and ethically
3. Contribute original knowledge in response to issues in their specialist area
4. Communicate research findings at a diverse range of levels and through a variety of media
5. Evaluate one's own research in relation to important and latest issues in the field

## COURSE DETAILS *(subject to change at instructor's discretion)*

**Year/Semester:** 2023-fall, First Semester  
**Time/Venue:** Thursdays, 9:30-12:20, KKL 1119  
**Instructor:** **Dr. Xing Hu**  
Email: [xinghu@hku.hk](mailto:xinghu@hku.hk)  
Office: KKL-812 (by appointment)

### I. Teaching and Learning Activities

In-class and Out-of-class Activities <i>(e.g. lectures, class discussion, papers reading, proposal writing)</i>	Expected hour	% of student study effort
1. Lecture with interactive presentation	36	30
2. Homework and self study	48	40
3. Paper study and student presentations	36	30
Total	120	100%

### II. Assessment

Assessment Components <i>(e.g. assignments, proposal, presentation, examination)</i>	Weight	CLOs to be assessed				
		1	2	3	4	5
1. Homework assignments	40%	√	√	√		
2. Class participation and discussion	20%	√	√	√	√	
3. Presentation	40%	√	√	√	√	
Total	100%					

**Students will be assessed based on the following performance standards:**

Course Grade	Performance Standard
Pass	Student has consistently demonstrated a substantial grasp of the subject as evidenced by original or exceptionally astute analysis and synthesis of student work.
Fail	Student has consistently demonstrated a limited grasp of the subject as evidenced by original or exceptionally astute analysis and synthesis of student work.

#### Assessment Component 1 *(Optional)*

Score	Performance Standard
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### Assessment Component 2 (Optional)

Score	Performance Standard

### Assessment Component 3 (Optional)

Score	Performance Standard

### Assessment Component 4 (Optional)

Score	Performance Standard

## III. Course Content and Tentative Schedule

- Introduction to dynamic programming, examples, problem formulation, the dynamic programming algorithm
- Deterministic systems and the shortest path problem
- Problems with perfect/imperfect state information
- Dynamic program for stochastic inventory control
- Optimal stopping time problem
- Introduction to infinite horizon problems
- Applications and Presentations

## IV. Required/Recommended Readings

1. Bertsekas, D.P. *Dynamic Programming and Optimal Control*. 2<sup>nd</sup> ed. Belmont, MA. Athena Scientific, 2000
2. Puterman, M.L. *Markov Decision Processes*. John Wiley & Sons, 1994

## V. Course Policy

**The University Regulations on academic dishonesty will be strictly enforced!** Academic dishonesty is behaviour in which a deliberately fraudulent misrepresentation is employed in an attempt to gain undeserved intellectual credit, either for oneself or for another. It includes, but is not necessarily limited to, the following types of cases:

- a. Plagiarism - The representation of someone else's ideas as if they are their own. Where the arguments, data, designs, etc., of someone else are being used in a paper, report, oral presentation, or similar academic project, this fact must be made explicitly clear by citing the appropriate references. The references must fully indicate the extent to which any parts of the project are not one's own work. Paraphrasing of someone else's ideas is still using someone else's ideas, and must be acknowledged. Please check the University Statement on plagiarism on the web: <http://www.hku.hk/plagiarism/>
- b. Unauthorized Collaboration on Out-of-Class Projects - The representation of work as solely one's own when in fact it is the result of a joint effort.
- c. Cheating on In-Class Exams - The covert gathering of information from other students, the use of unauthorized notes, unauthorized aids, etc.
- d. Unauthorized Advance Access to an Exam - The representation of materials prepared at leisure, as a result of unauthorized advance access (however obtained), as if it were prepared under the rigors of the exam setting. This misrepresentation is dishonest in itself even if there are not compounding factors, such as unauthorized uses of books or notes.

You are expected to do your own work whenever you are supposed to. Incident(s) of academic dishonesty will NOT be tolerated. Cheating or plagiarism of any kind would result in an automatic FAIL grade for the course plus strict enforcement of all Faculty and/or University regulations regarding such behaviour.